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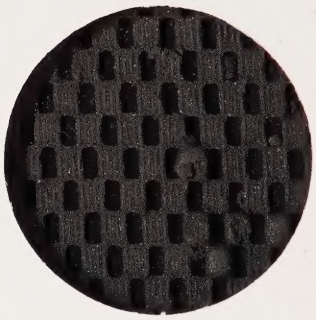
Status Report
of the Commissioner of the Environment and Sustainable Development to the House of Commons

Message from the Commissioner

Chapter 1
Safety of Drinking Water

Chapter 2
Air Quality Health Index—
Health Canada and Environment Canada

Office of the Auditor General of Canada



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The 2009 Status Report of the Commissioner of the Environment and Sustainable Development comprises a Message from the Commissioner and two chapters. The main table of contents is found at the end of this publication.

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Commissioner of the Environment and Sustainable Development of Canada
Commissaire à l'environnement et au développement durable du Canada
Office of the Auditor General of Canada • Bureau du vérificateur général du Canada

To the Honourable Speaker of the House of Commons:

On behalf of the Auditor General of Canada, I have the honour to transmit herewith this Status Report to the House of Commons for 2009, which is to be laid before the House in accordance with the provisions of sections 23(3) of the *Auditor General Act*.

Scott Vaughan
Commissioner of the Environment
and Sustainable Development

OTTAWA, 31 March 2009

To the reader:

I welcome your comments and suggestions on this Report and other issues related to the environment and sustainable development. I can be reached at the following address:

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Message from the Commissioner of the Environment and Sustainable Development—2009

Message from the Commissioner of the Environment and Sustainable Development—Status Report 2009



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Scott Vaughan
Commissioner of the Environment
and Sustainable Development

This Status Report contains two follow-up chapters on environmental issues that are fundamental to life: the safety of the water we drink and the quality of the air we breathe.

The federal government shares responsibility with other levels of government in helping to safeguard Canada's air and water. The federal role includes measuring air pollutants, regulating cross-border air pollution, and carrying out research on the health impacts of pollutants. In addition, the federal government regulates drinking water in federal facilities and on cross-border public transportation. It also develops science-based guidelines that set important criteria for water quality and that can be used by the provinces and territories, who regulate drinking water within their jurisdictions.

Our chapter on drinking water follows up on our 2005 audit on the safety of drinking water and also includes new work on bottled water. The chapter on the air quality health index examines whether the government has delivered on a commitment made at the 2001 Toronto Smog Summit to develop a Canada-wide air quality index based on health risks. The government reiterated its commitment in 2002 and 2003, in response to petitions submitted through the Commissioner of the Environment and Sustainable Development.

Status reports allow us to tell Parliament to what extent the government has met commitments made in response to our previous audit recommendations. I am pleased to report that we found satisfactory progress on both of the environmental issues examined for this report.

Safety of Drinking Water

In 2005, we reported that Health Canada was slow to develop and review its guidelines for the safety of drinking water. At the time, there was a backlog of about 50 guidelines that needed to be reviewed and, if necessary, updated to reflect current science.

We are pleased that the government has taken action to speed up the approval of the Guidelines for Canadian Drinking Water Quality and address the backlog.

We are also pleased that Health Canada has promoted the guidance it issued to federal departments in late 2005 on providing safe drinking water at federal facilities.

However, further work is needed in other areas—in particular, bringing regulations up-to-date to ensure safe drinking water on public conveyances, such as aircraft and trains, and in federally regulated transportation hubs, such as airports, as well as clarifying regulations that apply to bottled water.

Air Quality Health Index (AQHI)

The Air Quality Health Index (AQHI) is a tool designed to measure air quality based on levels of air pollutants known to harm human health. Like the UV index, with its 1 to 10 ranking of the sun's ultraviolet radiation, the AQHI—a snapshot of air quality at a given location—is a communication tool that allows Canadians to make informed decisions about their outdoor activities (for example, refraining from jogging) when pollution levels are high.

Our audit found that Environment Canada and Health Canada have made satisfactory progress in meeting their commitment to develop an AQHI, which has been piloted in several locations. We found that the government's approach to consultation could be a model for other programs. For example, the two departments consulted widely with governmental and non-governmental organizations at every stage of this initiative, and most participants said they were satisfied with the consultation process. Many of the groups consulted are custodians of technical information and are also committed to environmental protection.

Another ingredient of success in the government's approach to the Index was its scientific research and testing, which led to the selection of ground-level ozone, fine particulate matter, and nitrogen dioxide as three key pollutants that affect human health and that need to be monitored across Canada.

Health Canada and Environment Canada also developed a formula to ensure that the air quality values in the Index would be consistent across the country and easily understood by Canadians. The Index represents an innovative approach that, when fully operating across the country, will enable Canadians to make informed decisions about the health implications of outdoor activities in their specific locations.

Lessons learned and challenges ahead

The federal government faces a number of challenges related to better integrating the way it manages issues of water safety and air quality. The issues raised in both of these chapters underscore the importance of maintaining scientific capacity in government in order to shape and maintain tools and programs.

The Air Quality Health Index (AQHI) in particular shows the ongoing need for sufficient scientific expertise and capacity in government if it is to serve citizens in a number of areas related to health and the environment.

One of the key lessons learned from decades of environmental and sustainable development policies and reinforced by our audit findings on the AQHI is the benefit of transparency, meaningful public consultations, and the engagement of civil society. The success of even the most technically robust programs can be weakened when they are established without the input of the public they are designed to serve.

Our chapter on the AQHI demonstrates that actively engaging stakeholders in consultation can produce positive results. We are pleased about the government's satisfactory progress in the areas of drinking water safety and the development of an AQHI.

The elements of success identified in these two chapters can form a sound basis for tackling the critical challenges ahead. I hope that parliamentarians find the information in these two chapters useful in their scrutiny of government activities.

Chapter

1

Safety of Drinking Water

All of the audit work in this chapter was conducted in accordance with the standards for assurance engagements set by The Canadian Institute of Chartered Accountants. While the Office adopts these standards as the minimum requirement for our audits, we also draw upon the standards and practices of other disciplines.

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Safety of Drinking Water

Main Points

What we examined

In Canada, ensuring the safety of drinking water is a shared responsibility. The provinces and territories are mainly responsible for regulating the provision of safe drinking water. In collaboration with provincial and territorial governments, the federal government has lead responsibility for developing the science-based Guidelines for Canadian Drinking Water Quality that set important quality criteria.

The federal government has direct responsibility for the safety of drinking water provided in First Nations communities; at military bases, national parks, federal penitentiaries, and other federal facilities; and on public transportation conveyances travelling internationally and between provinces, such as aircraft, trains, and cruise ships. This responsibility represents thousands of federal facilities and sites with a variety of drinking water supply systems, and numerous transportation conveyances.

Our audit examined federal progress toward implementing our recommendations from 2005, when we reported that Health Canada was slow to develop and review the Guidelines for Canadian Drinking Water Quality. At the time, there was a backlog of about 50 guidelines potentially in need of updating to reflect current science. We also reported that procedures to ensure the provision of safe drinking water at selected federal facilities were inconsistent among federal departments—in some cases, exposing federal employees to potential health risks—and that clear central guidance from Health Canada was needed for federal organizations. In addition, we noted gaps in Health Canada's inspection approach for monitoring the safety of drinking water on aircraft, trains, and cruise ships; in particular, Health Canada was no longer routinely inspecting tap water on passenger aircraft used for drinking, making ice, and preparing food and beverages.

In the current audit, we also looked for the first time at how Health Canada and the Canadian Food Inspection Agency carry out their responsibilities regarding the safety of bottled drinking water.

Why it's important

How the federal government carries out its responsibilities for the safety of drinking water has an impact on millions of people, including travellers, national parks visitors, federal penitentiary inmates, bottled water consumers, and federal employees. In most of these cases, provincial and territorial regulations pertaining to safe drinking water do not apply. Given the potentially serious health consequences of contaminated drinking water, it is important for the federal government to know that in all areas under its jurisdiction, drinking water is safe—that is, it meets the Guidelines for Canadian Drinking Water Quality.

What we found

- Health Canada has made satisfactory progress in addressing our 2005 recommendations. For example, it now has a process in place to set priorities with plans and timelines for regularly updating the Guidelines for Canadian Drinking Water Quality and to produce new guidelines as appropriate. The process also addresses the backlog of old guidelines in need of review, and the Department has in fact updated a significant number of guidelines since 2005. In addition, Health Canada has promoted, to federal organizations, the guidance it issued in late 2005 on providing safe drinking water at federal facilities. However, it has not followed up to determine whether the guidance is being used. Work remains to be done in some other areas as well.
- Of the two federal organizations we looked at from among those we audited in 2005, one did not follow some of the procedures in Health Canada's guidance on preventing contamination of drinking water at all stages of the supply system. Gaps of this kind could leave drinking water systems on federal premises susceptible to contamination that could be prevented. We noted that Health Canada has not assessed whether its guidance is improving the management of the federal government's drinking water systems and whether some organizations need further help.
- Although Health Canada has resumed routine inspection of drinking water on passenger aircraft belonging to the major Canadian airlines, gaps remain in its inspection coverage of public conveyances and their ancillary services. Those services include facilities that provide the food and beverages served on board common carriers and in airports, railway stations, and seaports. In addition, the existing Health Canada regulations pertaining to public conveyances still do not refer to the Guidelines for Canadian Drinking Water Quality. Therefore, Health Canada cannot yet assure travellers about the safety of drinking water on board public conveyances under federal responsibility.

- Health Canada and the Canadian Food Inspection Agency have determined that risks to human health from bottled water are low and the Agency's inspection and monitoring practices for bottled water are based on this determination. However, while bottled water establishments must comply with the same regulations that govern all foods sold in Canada, the regulations specific to bottled water safety do not yet incorporate the Guidelines for Canadian Drinking Water Quality. Incorporating the Guidelines into the regulations would set a clear standard and therefore make it easier for the government to monitor and verify compliance.

The organizations have responded. The organizations to which we address recommendations have indicated their agreement. Their detailed responses follow each recommendation throughout the chapter.

Introduction

1.1 This status report follows up and builds on our 2005 Report, Chapter 4, Safety of Drinking Water: Federal Responsibilities. In that chapter, we looked at the federal government's roles and responsibilities for supplying safe drinking water to its employees and to the public at federal sites, and to travellers on public transportation conveyances.

1.2 Safe drinking water must be free of microbiological contaminants, and chemical contaminants must be kept at levels that are not harmful to health. To achieve this, the various components of the water supply system must be understood and managed as a whole—a "multi-barrier approach." This approach builds on the experience of Canadian jurisdictions and is promoted by the World Health Organization. Its main goal is to reduce the risk of contamination by placing protective systems, such as source protection measures and water treatment and monitoring, between the consumer and potential sources of contamination.

Shared responsibility

1.3 The federal government is responsible for the safety of drinking water in areas that do not fall under provincial or territorial legislation; examples include

- First Nations communities;
- military bases, national parks and historic sites, federal correctional institutions, ports of entry, Canadian missions abroad, and other federal facilities; and
- aircraft, trains, and cruise ships travelling between provinces and internationally.

The federal government also establishes and enforces policies and standards for the safety of bottled drinking water; thus, it has responsibility for providing safe drinking water to millions of people.

1.4 In addition, the federal government provides expertise to the Federal-Provincial-Territorial Committee on Drinking Water, which updates the **Guidelines for Canadian Drinking Water Quality** and develops new guidelines identified through risk assessments. Health Canada provides the scientific expertise for the Guidelines and, in its role as the technical secretariat, coordinates the activities of the Committee.

Guidelines for Canadian Drinking Water Quality

The Guidelines cover about 120 microbiological, chemical, and radiological contaminants in drinking water that must be eliminated or reduced to acceptable levels to protect human health. Individual guidelines state the maximum acceptable concentration of a contaminant in drinking water. The supporting document for each guideline describes sources of the contaminant in the environment, potential health effects, detection methods, and available treatment technology.

1.5 Providers of drinking water in Canada use the Guidelines as quality objectives. Therefore, they are an important part of the multi-barrier approach for protecting drinking water.

1.6 Some provinces and territories use the Guidelines as general guidance in setting their regulations; others use them directly as their legal standards. Some provinces have adopted the Guidelines in full within their legislation, while others have adopted specific guidelines that meet their needs.

1.7 Outside federal responsibilities, the provinces and territories regulate the supply of safe drinking water to the public, and municipalities normally oversee the day-to-day operation and maintenance of water treatment facilities and distribution infrastructure.

The federal government's responsibilities

1.8 **Federal facilities and sites.** The federal government is responsible for providing drinking water at thousands of federal facilities and sites across the country, using a variety of distribution systems. This obligation stems from the *Canada Labour Code* and its regulations. Under the Code, drinking water is considered to be water that meets the Guidelines for Canadian Drinking Water Quality. Drinking water systems on federal premises serve thousands of employees and millions of other people. Federal departments and agencies must take all reasonable precautions to ensure that their drinking water is safe.

1.9 **Public conveyances.** Under the *Department of Health Act*, Health Canada is responsible for protecting the health of travellers on aircraft, trains, and cruise ships and at ancillary services (facilities at airports, railway stations, and seaports) that provide their food and beverages. The *Potable Water Regulations for Common Carriers* address the provision and treatment of water for drinking and culinary purposes on **conveyances** operated by **common carriers**. According to the Regulations, Health Canada has the authority to inspect the quality of drinking water provided on conveyances.

Conveyance—Any aircraft, train, vessel, motor vehicle, or other mode of transportation used in international traffic, interprovincial traffic, and traffic on Canadian sea coasts, salt water bays, gulfs, and harbours, and on the Great Lakes and inland waters of Canada.

Common carrier—An owner of a conveyance, or any employee or agent that operates or manages it.

What we found in 2005

1.10 We observed that Health Canada's process for developing guidelines and reviewing contaminants for listing in the Guidelines for Canadian Drinking Water Quality was based on risk, science, consultation, and transparency; however, the process was slow.

At the time, we found a backlog of about 50 guidelines that had not been reviewed or updated for 15 years or more.

1.11 We also observed that procedures for managing the safety of drinking water at facilities of six federal organizations varied from comprehensive to incomplete or unclear. The resulting testing regimes to ensure safe drinking water differed considerably across the federal sites we examined. We noted that there was no central guidance document from Health Canada to help departments and agencies meet their obligation to provide safe drinking water at their facilities and sites.

1.12 In addition, we found that Health Canada was inspecting potable water on cruise ships and some trains but not on aircraft. We noted gaps and inconsistencies in Health Canada's inspection approach—in particular, the *Potable Water Regulations for Common Carriers* lacked water quality criteria, had weak and outdated enforcement criteria (including very low penalties for violations), and did not refer clearly to the government's responsibilities for ancillary services.

Events since 2005

1.13 **Guidance for federal departments and agencies.** Following our recommendation to finalize a central guidance document, in late 2005 Health Canada published the first version of its document titled Guidance for Providing Safe Drinking Water in Areas of Federal Jurisdiction. This was part of a project, which also included workshops, training, research, and newsletters, to support and advise federal providers of drinking water.

1.14 **New audit work: bottled drinking water.** Our 2005 audit did not examine federal roles and responsibilities for the safety of bottled water. However, because Canadians are drinking more bottled water, and concerns about its safety have been expressed in reports by interest groups, in specialized books, in a petition to the Office of the Auditor General, and in the media, we included this component in our current audit. The bottled water industry has grown significantly since the early 1980s. From 1998 to 2006, annual consumption per person in Canada increased from 28.4 litres to 66 litres, with a notable increase of 12.2 percent from 2005 to 2006 (Exhibit 1.1). Drinking bottled water is one of the alternatives recommended when the usual water supply is compromised.

Exhibit 1.1 **Canadians drank more than twice the amount of bottled water in 2006 than in 1998**



Source: Beverage Marketing Corporation (data) and Agriculture and Agri-Food Canada (graph design)

Focus of the audit

1.15 The objectives of our audit were

- to determine whether Health Canada had made satisfactory progress in carrying out the recommendations in the 2005 audit and whether Health Canada's central guidance document, published in 2005, was being used by two federal organizations, Correctional Service Canada and Parks Canada, to better manage their drinking water systems; and
- to determine whether Health Canada and the Canadian Food Inspection Agency carry out their roles and responsibilities for the safety of bottled water, which include establishing policies and standards that focus on health and safety standards, carrying out inspections based on these standards, and enforcing the standards.

1.16 We reported separately on issues concerning drinking water in First Nations communities in our 2005 Report, Chapter 5, Drinking Water in First Nations Communities. The current audit did not follow up on this chapter.

1.17 More details on the audit objectives, scope, approach, and criteria are in **About the Audit** at the end of this chapter.

Observations and Recommendations

Guidelines for Canadian Drinking Water Quality

Health Canada has improved the process for developing and reviewing guidelines

1.18 In 2005, we reported that Health Canada was slow to develop and review the Guidelines for Canadian Drinking Water Quality and that a backlog of about 50 guidelines might need updating to reflect current science. We recommended that Health Canada address these findings (Exhibit 1.2). Health Canada agreed with this recommendation and committed to producing a multi-year work plan for the Guidelines with clear timelines that included dealing with the backlog.

Exhibit 1.2 **Progress on addressing our recommendations on setting and updating guidelines**

2005 Report of the Commissioner of the Environment and Sustainable Development, Chapter 4	
Recommendation	**Progress**
Health Canada should set clear internal timelines for the development and review of drinking water guidelines and should continue to work with the Federal-Provincial-Territorial Committee to develop options to accelerate the process of approval of these guidelines. Factors impeding the approval and publication of guidelines should be made fully transparent to Canadians. (paragraph 4.22)	**Satisfactory**
Health Canada should produce and implement a work plan to address the backlog of about 50 drinking water guidelines that may need to be updated to reflect current science, clearly indicating which guidelines are to be reviewed, their priority ranking, revision targets, and related timelines. (paragraph 4.31)	**Satisfactory**

Satisfactory—Progress is satisfactory, given the significance and complexity of the issue, and the time that has elapsed since the recommendation was made.

Unsatisfactory—Progress is unsatisfactory, given the significance and complexity of the issue, and the time that has elapsed since the recommendation was made.

1.19 Three years later, Health Canada has a clear multi-year plan for adding new guidelines or reassessing existing ones. This plan also addresses the guidelines backlog that we identified in 2005. The Department sets priorities and timelines in collaboration with the Federal-Provincial-Territorial Committee on Drinking Water. Priorities are based on risks to human health, taking into consideration the frequency and concentration of contaminants detected in drinking water—that is, if contaminants are ingested for prolonged periods or are in water in high enough concentrations to be harmful. Health Canada reviews the priorities annually, or more frequently if new

information from organizations such as the United States Environmental Protection Agency and the World Health Organization justifies it. The Department estimates that to revise or add a guideline now takes about two to three-and-a-half years to develop from the start of the assessment process to publication. So far, Health Canada has set priorities for 59 higher-risk microbiological, chemical, and radiological contaminants, 30 of which have been scheduled for assessment by December 2011.

1.20 Health Canada has also worked with the Federal-Provincial-Territorial Committee to accelerate the process for approval of guidelines through improved administrative procedures and enhanced communication with Committee members. Over the last three years, 11 guidelines have been revised or added and 42 guidelines have been reaffirmed (guidelines are reaffirmed when no new scientific data triggers a detailed review). For the most part, Health Canada is adhering to its timelines and continues to work closely with the Committee. Currently, no significant factors are impeding the approval process. Committee members from outside the federal government stated that even if Health Canada allocated more resources to developing guidelines, the provinces and territories could not handle an increased volume at a faster pace.

Drinking water at federal facilities and sites

Health Canada has promoted its central guidance document for federal water providers

1.21 In 2005, we recommended that Health Canada finalize and issue, to all deputy heads, the risk-based central guidance document it was developing on providing safe drinking water in federal jurisdictions—water that would meet the requirements of the Guidelines for Canadian Drinking Water Quality. We also recommended that Health Canada update the document as needed and promote its use to federal organizations. Health Canada agreed with this recommendation and committed to publishing the central guidance document and updating it periodically.

1.22 Health Canada has published and promoted this central guidance document. In late 2005, the Department issued the first version of the Guidance for Providing Safe Drinking Water in Areas of Federal Jurisdiction to deputy heads of federal departments and agencies (Exhibit 1.3). Promotional activities included interdepartmental workshops and training sessions, and newsletters. The Department expects to publish an updated version of the Guidance by June 2009.

Exhibit 1.3 Progress on addressing our recommendation on publishing a central guidance document for providing safe drinking water

2005 Report of the Commissioner of the Environment and Sustainable Development, Chapter 4	
Recommendation	**Progress**
Health Canada should finalize and issue to all deputy heads the guidance it has developed for providing safe drinking water in areas of federal jurisdiction. It should also update the guidance as needed and promote its use by federal organizations. (paragraph 4.46)	**Satisfactory**

Satisfactory—Progress is satisfactory, given the significance and complexity of the issue, and the time that has elapsed since the recommendation was made.

Unsatisfactory—Progress is unsatisfactory, given the significance and complexity of the issue, and the time that has elapsed since the recommendation was made.

1.23 The central guidance document is based on a multi-barrier, risk-based approach. It states the importance of establishing testing regimes based on assessed risks at each stage of the drinking water supply system and refers explicitly to using the latest Guidelines for Canadian Drinking Water Quality. Regardless of the complexity of the water supply (whether the facility treats its own water from the source or is connected to the municipal system), the central guidance document sets minimum standards that drinking water should meet (organizations may choose to follow provincial or municipal requirements where these are more stringent).

Health Canada's central guidance is not always applied

1.24 A key observation in our 2005 chapter was the inconsistency in the way the six federal organizations we examined managed their drinking water systems. We noted that some of these organizations had not issued internal guidance on how to manage risks posed by their water sources. Of the organizations that provided guidance, the majority had not conducted risk assessments at many of their sites and did not have complete testing procedures in place. Three years after the publication and promotion of Health Canada's central guidance document, we expected to see improvements in how risks to the quality of drinking water were identified and managed. In this audit, we looked at two federal organizations: Correctional Service Canada and Parks Canada.

Correctional Service Canada is responsible for some 14,500 incarcerated offenders and employs about the same number of staff across the country.

Parks Canada employs about 5,400 people. Nearly 22 million people visited national parks and historic sites in the 2006–07 fiscal year.

1.25 Parks Canada published its own guidance in December 2006. We found it to be consistent with Health Canada's central guidance document, and it is being applied at the five national parks and



Open source water supply and well at a Parks Canada site

27 historic sites we examined. Correctional Service Canada's guidance was released in February 2005, predating Health Canada's central guidance document. We noted that both Parks Canada's and Correctional Service Canada's guidance documents conform to Health Canada's central guidance in stating the importance of having appropriate training and certification for operators of water treatment plants and distribution systems, using accredited laboratories, and setting out a process for corrective action should contamination occur. Wherever we observed test results indicating problems with the quality of drinking water, corrective measures were applied immediately.

1.26 However, we found that Correctional Service Canada's guidance document does not clearly refer to the multi-barrier or risk-based approach that is the main principle of Health Canada's document. In particular, for institutions connected to municipal water supplies, it contains gaps in its testing regimes for important classes of bacteriological, chemical, and physical contaminants (Exhibit 1.4 provides an example of the need for a risk-based approach). Health Canada recommends that, even when a facility is connected to a well-regulated municipal supply, the federal organization needs to check for vulnerabilities within its own plumbing systems, as well as be informed about the municipality's drinking water program.

Exhibit 1.4 Correctional Service Canada might have prevented problems earlier with a risk-based approach



Protected water facility at a Correctional Service Canada institution

As a result of a municipal advisory regarding lead in the plumbing of buildings constructed before 1950, a regional manager at Correctional Service Canada was alerted that this might cause problems at some of the Agency's local facilities.

Laboratory analysis of a series of water samples taken between September 2006 and April 2008 confirmed that, at most of the institutions in that region, between one third and one half of the samples contained lead at levels higher than recommended in the Guidelines for Canadian Drinking Water Quality. The cause was lead from the facilities' aging water distribution systems and not the municipal water supply to which they were connected. Correctional Service Canada did not know how long the lead problem had existed. We noted that, contrary to recommendations in Health Canada's central guidance document, Correctional Service Canada's internal guidance does not require testing for lead or other chemical and physical contaminants at sites that are supplied by municipal systems.

At the time of our audit, the Agency was exploring long-term solutions for these facilities. Meanwhile, it had taken interim measures, such as flushing the system regularly and closing down some drinking fountains, to avoid consumption of contaminated water. In July 2008, the Department issued a note to all regions, with information on lead in water distribution systems, sampling protocols, and remedial measures.

1.27 Health Canada's central guidance document was developed to help federal departments and agencies meet their obligations to provide safe drinking water at their facilities and sites. Given our findings, Correctional Service Canada could benefit from Health Canada's support and advice—one of its responsibilities—in setting up risk-based management systems for drinking water.

1.28 Recommendation. Correctional Service Canada should modify its procedures for managing its drinking water systems to conform to Health Canada's risk-based central guidance document.

Correctional Service Canada's response. Correctional Service Canada agrees to review its procedures on managing its drinking water systems and adjust them to reflect Health Canada's latest risk-based guidance expected to be released shortly. The revised procedures should be updated and communicated to staff by 30 September 2009.

Health Canada does not follow up on whether its guidance is used

1.29 In 2005, we found that the majority of organizations we looked at had not done risk assessments at their sites. We also found that testing regimes were often incomplete and testing procedures were inconsistent. In the current audit, we found similar gaps in one of the two organizations we examined, despite the publication of Health Canada's central guidance. Thus, the next steps are to assess whether this guidance is improving the management of drinking water systems and to identify where Health Canada's help is still required. Many federal providers of drinking water rely on Health Canada's advice and guidance to help them meet their *Canada Labour Code* requirements.

1.30 Recommendation. Health Canada should determine whether federal departments and agencies are using key elements of its risk-based central guidance document on providing safe drinking water and identify areas where Health Canada's help is required.

Health Canada's response. Health Canada will work with departments and agencies to determine the extent to which they are applying these key elements of the central guidance document. This consultative approach will be used to determine where gaps exist and to identify areas for improvement. Health Canada will then work with the key relevant federal players to assess and consider appropriate next steps that should be taken. The Department expects to complete these actions by 31 March 2010.

Drinking water on common carriers

Health Canada has initiated an inspection program for aircraft

1.31 From the mid-1990s until three years ago, Health Canada no longer conducted its routine inspections of drinking water on aircraft, as direct government funding for its inspection program had been removed. The Department had not reached cost recovery agreements because the airlines were unwilling to pay for inspections by Health Canada. The Department responded to our 2005 recommendation by stating that it would continue negotiating with the airline industry to bring it into its voluntary, cost recovery inspection program.

1.32 In 2006, Health Canada conducted a baseline sampling survey and began routinely sampling drinking water on aircraft belonging to nine major Canadian airlines at major airports across the country. Health Canada then worked with these airlines to develop voluntary management plans for drinking water that specified sampling locations, frequency, and sanitizing procedures. The plans stated that, should water become contaminated, it would be the responsibility of the airlines to remedy the problem and demonstrate that the water is fit to drink; otherwise, travellers must be given bottled water or another safe alternative. Health Canada has begun auditing the performance of these management plans and has recommended some improvements. In 2008, the Department extended these planning and sampling activities to include four more Canadian airlines. The 13 airlines are the larger Canadian companies that carry the majority of travellers on Canadian airlines. Thus, the Department has made progress toward verifying that drinking water on aircraft is safe (Exhibit 1.5).



Aircraft galley

1.33 Despite progress since 2005, further work is needed before Canadians can be sure that the water on board all commercial

Exhibit 1.5 Progress on addressing our recommendation on taking measures to assure Canadians that potable water on aircraft is safe

2005 Report of the Commissioner of the Environment and Sustainable Development, Chapter 4	
Recommendation	**Progress**
Health Canada should take measures to clearly assure Canadians that potable water on aircraft is safe on a continuing basis, including recommencing routine inspections. (paragraph 4.53)	**Satisfactory**

Satisfactory—Progress is satisfactory, given the significance and complexity of the issue, and the time that has elapsed since the recommendation was made.

Unsatisfactory—Progress is unsatisfactory, given the significance and complexity of the issue, and the time that has elapsed since the recommendation was made.

passenger aircraft is safe to drink. Health Canada has not made specific plans for inspecting other smaller Canadian companies and foreign airlines departing from Canadian airports; nor does it know exactly how many of these companies and aircraft need monitoring. Since the airlines were unwilling to pay for inspections by Health Canada, we noted that Health Canada reallocated internal resources to pay all the expenses of its inspection and audit activities for airline drinking water. We also noted that inspection coverage for trains and cruise ships is incomplete, as not all companies are part of Health Canada's voluntary compliance program. Also, in contrast to the airlines, Health Canada recovers its inspection costs from the other carriers.

1.34 **Recommendation.** Health Canada should expand its risk-based drinking water monitoring program to include all common carriers for which it is responsible under the *Department of Health Act*.

Health Canada's response. During the 2009–10 fiscal year, Health Canada will expand its risk-based drinking water monitoring program that is currently in place with the airline industry to other common carriers for which it is responsible under the *Department of Health Act* (trains, vessels, and buses).

Health Canada has not revised the *Potable Water Regulations for Common Carriers*

1.35 Our 2005 audit pointed out that the *Potable Water Regulations for Common Carriers*—covering aircraft, trains, and cruise ships—were outdated as they did not refer to the Guidelines for Canadian Drinking Water Quality, and that penalties for non-compliance needed revising. Further, the Regulations were unclear about Health Canada's responsibilities for inspecting ancillary services; these include facilities that provide the food and beverages served on board common carriers and in airports, railway stations, and seaports. Following our 2005 recommendation to address these issues, Health Canada acknowledged the need for updated legislation to address public health risks on common carriers. The Department proposed drawing up comprehensive legislation that would cover food, air quality, general sanitation, and drinking water.

1.36 The Department's progress has been limited to researching legislative and regulatory options. At the time of our audit, it had not yet committed to further action (Exhibit 1.6). Therefore, we repeat our recommendation of 2005, as the actions it advised have not been carried out.

Exhibit 1.6 **Progress on addressing our recommendation on revising the *Potable Water Regulations for Common Carriers***

2005 Report of the Commissioner of the Environment and Sustainable Development, Chapter 4	
Recommendation	**Progress**
Health Canada should revise the *Potable Water Regulations for Common Carriers* to include reference to the Guidelines for Canadian Drinking Water Quality, a clear definition for ancillary services, and more appropriate penalties for non-compliance. (paragraph 4.55)	**Unsatisfactory**

Satisfactory—Progress is satisfactory, given the significance and complexity of the issue, and the time that has elapsed since the recommendation was made.

Unsatisfactory—Progress is unsatisfactory, given the significance and complexity of the issue, and the time that has elapsed since the recommendation was made.

1.37 **Recommendation.** Health Canada should revise the *Potable Water Regulations for Common Carriers* to include reference to the Guidelines for Canadian Drinking Water Quality, a clear definition of the government's responsibilities for ancillary services, and more appropriate penalties for non-compliance.

Health Canada's response. Health Canada continues to develop a comprehensive approach to address potential public health risks on conveyances and their ancillary services associated with potable water, food, air quality, and general sanitation. This new approach to replace the *Potable Water Regulations for Common Carriers* is intended to address compliance and enforcement measures, definitions, and referencing of the Guidelines for Canadian Drinking Water Quality. The Department anticipates that this comprehensive approach will be completed between 2010 and 2012.

Bottled water

Bottled water regulations do not refer to the Guidelines for Canadian Drinking Water Quality

1.38 Bottled water is considered to be a food product and is regulated under the *Food and Drugs Act* and the *Food and Drug Regulations*. The *Food and Drugs Act* is the main federal legislation for managing risks to food safety and applies to all food sold in Canada. The Act prohibits the manufacture or sale of food products that are potentially harmful to human health. The *Food and Drug Regulations* set out standards for food safety. For bottled water, the Regulations also state what can be considered mineral or spring water, what may be added to it, and how the container is to be labelled.

1.39 Under the *Food and Drugs Act*, Health Canada is responsible for establishing policies and standards on the safety of food sold in this country. We expected Health Canada to have up-to-date health and safety standards for bottled water. However, the current *Food and Drug Regulations* specific to bottled water date back to 1973, with the exception of some changes that were made in the 1980s. The Regulations do not mention the Guidelines for Canadian Drinking Water Quality.

1.40 We found that Health Canada has been working for at least seven years on revisions to sections of the *Food and Drug Regulations* that apply to bottled water to incorporate the Guidelines. This would clarify safety standards and improve efficiency by removing the need to conduct separate health risk assessments using the specific guideline for each contaminant as the case arises. Incorporating the Guidelines into the Regulations would also make it easier for the federal government to monitor and verify compliance. Health Canada expected the revisions to be in place by 2006, but at the time of the current audit, the changes had still not been made.

1.41 **Recommendation.** Health Canada should set clear timelines and revise the *Food and Drug Regulations* that relate to bottled water safety so that they refer to the Guidelines for Canadian Drinking Water Quality.

Health Canada's response. Although the health risks associated with bottled water are low, Health Canada acknowledges the need to modernize the health and safety requirements for bottled water under the *Food and Drug Regulations*, based on the Guidelines for Canadian Drinking Water Quality. By 31 March 2009, Health Canada will post a document on its website that summarizes all the consultation activities that have been held on the proposed revisions to the bottled water regulations. The Department will then engage in the regulatory process to make the necessary amendments.

Risks associated with bottled water are assessed and monitored

1.42 The Canadian Food Inspection Agency (the Agency) is responsible for delivering inspection programs that enforce Health Canada's food policies and standards. As part of a risk-based approach for verifying the safety of bottled drinking water, we expected Health Canada and the Agency to monitor the bottled water industry, exchange information with the industry, and inform Canadians of any safety issues. We also expected the Agency to enforce the *Food and Drug Regulations* as necessary.

1.43 Assessing the risks to the safety of food is important for determining the appropriate level of oversight. The Food Safety Science Committee, a joint Health Canada and Agency body, identifies safety risks and provides risk management advice for food products. Health Canada and the Agency also examine new scientific information, findings from other industrialized countries and international bodies such as the World Health Organization, and the Agency's own inspection findings. We found that, based on this information, Health Canada and the Agency have determined that the health risks from drinking bottled water are low. Further, we found that the Agency's inspection and monitoring process is based on this determination.

1.44 The Agency carries out its enforcement responsibilities through risk-based inspections and sampling procedures at food processing establishments and at the premises of importers and retailers. Inspections verify that food is manufactured, prepared, preserved, packaged, and stored for sale under sanitary conditions in compliance with Canadian requirements. Between April 2007 and August 2008, the Agency conducted about 70 inspections as part of a series of projects to monitor bottled water establishments. Of these 70 inspections, most found no issues or only minor ones. These issues related to record keeping, facilities or equipment requiring repair, and staff training programs and protective clothing. In six instances, inspectors found more significant faults in some of the same areas, as well as insufficient evidence of product monitoring and procedures for handling complaints. There were no instances where inspectors found establishments that lacked critical controls over food safety hazards associated with high health risks.

1.45 We noted that inspection documentation on bottled water prior to April 2007 is kept at the regional or local level, making it difficult to retrieve. However, the Agency has centralized its tracking system to provide its personnel with easier access to inspection outcomes and is working on further improvements. It is important that the Agency keep up-to-date, readily accessible records as part of the risk assessment process for bottled water.

1.46 The Agency shares its results with each company it inspects, and both the Agency and Health Canada provide general information about the safety of bottled water to the public. In cases of food advisories and recalls, the Agency would inform the public through media and Internet bulletins.

1.47 For all foods, the Agency's enforcement actions can include detaining, seizing, or recalling products, depending on how seriously regulations have been contravened, potential health risks, and the

compliance history of the company. For the issues found during the 2007–08 inspections of bottled water establishments, the Agency required corrective action as necessary.

Conclusion

1.48 Health Canada has made satisfactory progress in addressing recommendations in our 2005 Report, Chapter 4, Safety of Drinking Water: Federal Responsibilities.

1.49 Health Canada now has a process in place to set priorities with plans and timelines for regularly updating the Guidelines for Canadian Drinking Water Quality and to produce new guidelines as appropriate. The process also addresses the backlog of old guidelines in need of review. In addition, Health Canada has promoted, to federal departments, the central guidance it issued in late 2005 on providing safe drinking water at federal facilities.

1.50 We found that one of the two federal organizations we examined in this audit did not follow some of the procedures in Health Canada's guidance on preventing contamination of drinking water at all stages of the supply system. Gaps of this kind could leave drinking water on federal premises susceptible to contamination that could be prevented. We noted that Health Canada has not assessed whether its guidance is improving the management of the federal government's drinking water systems and whether some organizations need further help.

1.51 While Health Canada has resumed routine inspection of drinking water on passenger aircraft belonging to the major Canadian airlines, gaps remain in its inspection coverage of public conveyances and their ancillary services. In addition, the existing Health Canada regulations pertaining to public conveyances still do not refer to the Guidelines for Canadian Drinking Water Quality. This means that further work is needed before Canadians can be sure that the water on board aircraft and other public conveyances under federal jurisdiction is safe to drink.

1.52 Health Canada and the Canadian Food Inspection Agency carry out their roles and responsibilities with respect to the safety of bottled water. We found that they have determined that risks to human health from bottled water are low, and that the Agency's inspection and monitoring practices are based on this determination. Bottled water establishments must comply with the same regulations that govern all foods sold in Canada. However, although Health Canada refers to the

Guidelines for Canadian Drinking Water Quality as part of its health risk assessments, the Guidelines have not yet been incorporated into the *Food and Drug Regulations*. Incorporating the Guidelines into the Regulations would set a clear standard and therefore make it easier for the federal government to monitor and verify compliance.

About the Audit

Objectives

The first objective of the audit was to determine whether Health Canada can demonstrate that it has made satisfactory progress in carrying out the recommendations made in 2005 regarding its responsibilities for the safety of drinking water. The sub-objectives were to determine whether

- Health Canada can demonstrate that it has made satisfactory progress in improving the process of establishing guidelines and obtaining approval for the Guidelines on Canadian Drinking Water Quality and in addressing the backlog of guidelines that need to be updated;
- Health Canada can demonstrate that it has completed and published a central guidance document for managing drinking water systems at federal facilities;
- Correctional Service Canada and Parks Canada can demonstrate that, based on Health Canada's risk-based central guidance document published in late 2005, they have improved the management systems for drinking water at their facilities and sites; and
- Health Canada can demonstrate that it is taking measures to ensure the safety of drinking water on aircraft and is revising the outdated *Potable Water Regulations for Common Carriers* to address identified gaps.

The second objective of our audit was to determine whether Health Canada and the Canadian Food Inspection Agency carry out their roles and responsibilities for the safety of bottled water, which include establishing policies and standards that focus on health and safety, carrying out inspections based on these standards, and enforcing the standards.

Scope and approach

We selected two organizations from among the six we looked at as part of the previous audit—Correctional Service Canada and Parks Canada—to determine whether the availability of Health Canada's central guidance document led to improved risk-based management systems for drinking water at their sites. We selected sites based on the following considerations:

- the facilities are used by a large number of federal employees, visitors, and residents;
- the sites are in various regions of Canada, in urban (connected to municipal water systems) and rural areas (having their own water sources, such as rivers or wells); and
- the age of the facilities varies.

We audited the following federal organizations:

- Health Canada,
- the Canadian Food Inspection Agency,
- Correctional Service Canada, and
- Parks Canada.

We reviewed documents and data, conducted interviews, and examined procedures to assess whether the organizations were meeting our audit criteria. We conducted audit work at headquarters and regional offices of the organizations and visited Correctional Service Canada and Parks Canada sites in various parts of Canada. We did not carry out water sampling. Rather, we expected the organizations to demonstrate that a risk-based approach to managing their drinking water systems was in place.

Criteria

Listed below are the criteria that were used to conduct this audit and their sources.

Criteria	Sources
We expected Health Canada to have set clear internal timelines for developing and reviewing the Guidelines for Canadian Drinking Water Quality, and to have worked with the Federal-Provincial-Territorial Committee on Drinking Water to develop options to accelerate the process of approval of these guidelines. We also expected factors impeding the approval and publication of guidelines to be made transparent to Canadians.	Departmental response to September 2005 Report of the Commissioner of the Environment and Sustainable Development, Chapter 4, Safety of Drinking Water: Federal Responsibilities, paragraph 4.22
We expected Health Canada to have produced and implemented a work plan to address the backlog of drinking water guidelines that may need to be updated to reflect current science. We also expected Health Canada to have clearly indicated which guidelines are to be reviewed, their priority ranking, revision targets, and related timelines.	Departmental response to September 2005 Report of the Commissioner of the Environment and Sustainable Development, Chapter 4, Safety of Drinking Water: Federal Responsibilities, paragraph 4.31
We expected Health Canada to have finalized and issued to all deputy heads a central guidance document on providing safe drinking water in areas of federal jurisdiction, to have promoted its use by federal organizations, and to update it as needed.	Departmental response to September 2005 Report of the Commissioner of the Environment and Sustainable Development, Chapter 4, Safety of Drinking Water: Federal Responsibilities, paragraph 4.46
We expected Correctional Service Canada and Parks Canada to have adopted a multi-barrier or risk-based approach to managing the safety of drinking water at their facilities and sites, as recommended by Health Canada.	• Health Canada, Guidance for Providing Safe Drinking Water in Areas of Federal Jurisdiction (2005) • Department of Justice Canada, <http://laws.justice.gc.ca>, *Canada Labour Code* (R.S., 1985, c. L-2.) Part II, para. 125(1)(j) • Department of Justice Canada, <http://laws.justice.gc.ca>, *Canada Occupational Health and Safety Regulations,* SOR/86-304, Part IX, s. 9(24)
We expected Health Canada to have taken measures, including routine inspections, to assure Canadians that the potable water on aircraft is safe and continues to be safe.	Departmental response to September 2005 Report of the Commissioner of the Environment and Sustainable Development, Chapter 4, Safety of Drinking Water: Federal Responsibilities, paragraph 4.53
We expected Health Canada to have revised the *Potable Water Regulations for Common Carriers* to include references to the Guidelines for Canadian Drinking Water Quality, a clear definition for ancillary services, and more appropriate penalties for non-compliance.	Departmental response to September 2005 Report of the Commissioner of the Environment and Sustainable Development, Chapter 4, Safety of Drinking Water: Federal Responsibilities, paragraph 4.55

Criteria	Sources
We expected Health Canada to have in place up-to-date health and safety standards for bottled water sold in Canada.	• Department of Justice Canada, <http://laws.justice.gc.ca>, *Department of Health Act* (1996, c. 8) s. 4(2)(d) • Department of Justice Canada, <http://laws.justice.gc.ca>, *Canadian Food Inspection Agency Act* (1997, c. 6) s. 11(4) • Health Canada, Food and Nutrition (2008), page 1, paragraph 3 • Health Canada, Towards a Regulatory Modernization Strategy for Food and Nutrition (2007), page 5 • Health Canada, Health Products and Food Branch, Business Plan 2007–08, page 4
We expected the Canadian Food Inspection Agency to undertake inspections as required and to enforce the regulations as necessary.	• Department of Justice Canada, <http://laws.justice.gc.ca>, *Canadian Food Inspection Agency Act* (1997, c. 6) s. 11(3) (a) • Health Canada, Food and Nutrition (2008), page 1, paragraph 3 • Canadian Food Inspection Agency, Fact Sheet (2005), page 3
We expected Health Canada and the Canadian Food Inspection Agency to monitor the bottled water industry, to exchange information with its members, and to inform Canadians of any safety issues.	• Department of Justice Canada, <http://laws.justice.gc.ca>, *Department of Health Act* (1996, c. 8) s. 4.(2)(c) • Health Canada, Health Products and Food Branch, Strategic Plan 2007–12, pages 4-5 • Health Canada, Health Products and Food Branch, Business Plan 2007–08, page 5 • Health Canada, Towards a Regulatory Modernization Strategy for Food and Nutrition (2007), page 5 • Health Canada, Mission, Values and Activities (2007), page 3 • Canadian Food Inspection Agency, Corporate Business Plan 2003–08, page 14

Audit work completed

Audit work for this chapter was substantially completed on 12 September 2008.

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Appendix List of recommendations

The following is a list of recommendations found in Chapter 1. The number in front of the recommendation indicates the paragraph number where it appears in the chapter. The numbers in parentheses indicate the paragraph numbers where the topic is discussed.

Recommendation	Response
Drinking water at federal facilities and sites	
1.28 Correctional Service Canada should modify its procedures for managing its drinking water systems to conform to Health Canada's risk-based central guidance document. **(1.24–1.27)**	**Correctional Service Canada's response.** Correctional Service Canada agrees to review its procedures on managing its drinking water systems and adjust them to reflect Health Canada's latest risk-based guidance expected to be released shortly. The revised procedures should be updated and communicated to staff by 30 September 2009.
1.30 Health Canada should determine whether federal departments and agencies are using key elements of its risk-based central guidance document on providing safe drinking water and identify areas where Health Canada's help is required. **(1.29)**	**Health Canada's response.** Health Canada will work with departments and agencies to determine the extent to which they are applying these key elements of the central guidance document. This consultative approach will be used to determine where gaps exist and to identify areas for improvement. Health Canada will then work with the key relevant federal players to assess and consider appropriate next steps that should be taken. The Department expects to complete these actions by 31 March 2010.
Drinking water on common carriers	
1.34 Health Canada should expand its risk-based drinking water monitoring program to include all common carriers for which it is responsible under the *Department of Health Act*. **(1.31–1.33)**	**Health Canada's response.** During the 2009–10 fiscal year, Health Canada will expand its risk-based drinking water monitoring program that is currently in place with the airline industry to other common carriers for which it is responsible under the *Department of Health Act* (trains, vessels, and buses).

Recommendation	Response
1.37 Health Canada should revise the *Potable Water Regulations for Common Carriers* to include reference to the Guidelines for Canadian Drinking Water Quality, a clear definition of the government's responsibilities for ancillary services, and more appropriate penalties for non-compliance. **(1.35–1.36)**	**Health Canada's response.** Health Canada continues to develop a comprehensive approach to address potential public health risks on conveyances and their ancillary services associated with potable water, food, air quality, and general sanitation. This new approach to replace the *Potable Water Regulations for Common Carriers* is intended to address compliance and enforcement measures, definitions, and referencing of the Guidelines for Canadian Drinking Water Quality. The Department anticipates that this comprehensive approach will be completed between 2010 and 2012.
Bottled water	
1.41 Health Canada should set clear timelines and revise the *Food and Drug Regulations* that relate to bottled water safety so that they refer to the Guidelines for Canadian Drinking Water Quality. **(1.38–1.40)**	**Health Canada's response.** Although the health risks associated with bottled water are low, Health Canada acknowledges the need to modernize the health and safety requirements for bottled water under the *Food and Drug Regulations* based on the Guidelines for Canadian Drinking Water Quality. By 31 March 2009, Health Canada will post a document on its website that summarizes all the consultation activities that have been held on the proposed revisions to the bottled water regulations. The Department will then engage in the regulatory process to make the necessary amendments.

Chapter

2

Air Quality Health Index

Health Canada and Environment Canada

All of the audit work in this chapter was conducted in accordance with the standards for assurance engagements set by The Canadian Institute of Chartered Accountants. While the Office adopts these standards as the minimum requirement for our audits, we also draw upon the standards and practices of other disciplines.

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Air Quality Health Index
Health Canada and Environment Canada

Main Points

What we examined

The Air Quality Health Index is an indicator of the health risks associated with air quality, based on measuring air pollutants known to harm human health. It takes into account how even low levels of exposure to multiple pollutants, such as ground-level ozone and other components of smog, can affect the health of Canadians.

Under the *Canadian Environmental Protection Act, 1999* (CEPA 1999), Health Canada has federal responsibility for health research; Environment Canada monitors air pollution and establishes standards.

In 2002 and 2003, two environmental petitions were submitted through the Commissioner of the Environment and Sustainable Development asking what the government was doing to manage air pollution and cross-border pollution. In response, Environment Canada and Health Canada reiterated the commitment made at the 2001 Toronto Smog Summit that they would develop a Canada-wide air quality index based on health risks. We examined their progress toward meeting that commitment.

Why it's important

According to various sources, the people who are most vulnerable to air pollution are those over 65, infants, children, individuals who engage in strenuous outdoor activity, and people who already have health problems.

Public opinion research shows that Canadians recognize air pollution as a major environmental problem that poses a risk to human health. The Air Quality Health Index is intended as a communication tool providing a measure of air quality and its potential impact on human health; individual Canadians can then decide what precautions they will take when air pollution is high. The air quality index used to date provides information on air quality but not on potential health effects, and the science behind the index was also seen as outdated.

What we found

- Environment Canada and Health Canada have made satisfactory progress in developing an air quality health index, which is currently being pilot-tested in selected locations. In the development stage of the Index, the departments carried out scientific research leading to

the selection of three key pollutants affecting human health that are included in the Air Quality Health Index (ground-level ozone, fine particulate matter, and nitrogen dioxide).

- From the beginning of the Air Quality Health Index development process, Environment Canada and Health Canada consulted with a wide variety of provincial governments and stakeholders, such as municipalities and non-government organizations, and have incorporated their ideas as appropriate. Most participants said that they were satisfied with the consultation process.
- Elements of the new index that working groups identified as remaining challenges include working with the provinces on issues related to the total or partial phase-out of their existing air quality indices. Further, the monitoring data apply to large population centres but not to smaller, rural areas, where the capacity to monitor pollutants is limited. In addition, there is an increased risk that a common index may not be put in place across the country, since not all jurisdictions participated in the index development process. Finally, the Index covers three pollutants monitored nationwide; it does not cover local and regional concentrations of other pollutants that also are assumed to have harmful health effects.

Introduction

2.1 Air pollution is primarily caused by the burning of fossil fuels (oil, diesel fuel, natural gas, and coal) in activities that both industry and individuals undertake. Industrial activities include power generation, oil and gas production, metal smelting, transportation, and the production of consumer products. Activities connected to individuals include residential heating and transportation. These activities generate air pollutants that include, but are not limited to, ground-level ozone, particulate matter, nitrogen oxides, volatile organic compounds, sulphur dioxide, and carbon monoxide. Exhibit 2.1 describes these air pollutants and their health and environmental effects.

The impact of air pollution in Canada

2.2 Public opinion research commissioned by Health Canada in the 2004–05 fiscal year found that Canadians recognize air pollution as a major environmental problem that poses a risk to human health. In August 2008, the Canadian Medical Association (CMA) estimated that some 2,600 Canadians would die prematurely in 2008 from the effects of acute, short-term exposure to air pollution. The vast majority of premature deaths from air pollution occur among people aged 65 or older. This link between short-term exposure to air pollution and premature deaths is consistent with findings of recent studies in the United States and in Europe. Health Canada has also acknowledged that air pollution is associated with thousands of premature deaths in Canada every year.

Shared responsibility for air quality

2.3 The federal, provincial, and territorial governments share responsibility for air quality in Canada. The federal government regulates interprovincial and international air pollution, negotiates and enters into international treaties, and is responsible for federally owned lands and works. The provinces have broad power to regulate pollution within provincial boundaries, and are historically the primary regulators of industrial air polluters. In addition, they are responsible for operating the air quality monitoring networks. To clarify roles and responsibilities and to establish a standard approach to environmental protection across Canada, the federal, provincial (except Quebec), and territorial governments agreed to work in partnership under the framework of the 1998 Canada-wide Accord on Environmental Harmonization, a consensus document agreed to by the Canadian Council of Ministers of the Environment (CCME), and its Canada-wide Environmental Standards Sub-Agreement.

Exhibit 2.1 Air pollutants and their effects on health and the environment

Pollutant	Description	Health and Environmental Effects
Ground-level Ozone (O_3)	Ground-level ozone is a colourless and highly irritating gas that forms just above the earth's surface. It is a secondary pollutant produced when nitrogen oxides (NO_x) and volatile organic compounds (VOCs) mix.	• Nausea, eye irritation and headaches, decreased lung function; increased respiratory illness; increased mortality. • Destroys vegetation, forests, and synthetic materials.
Particulate Matter (TPM, PM_{10} and $PM_{2.5}$)	Particulate matter (PM) consists of airborne particles in solid or liquid form. The size of PM particles largely determines the extent of environmental and health damage caused. There are three different sizes of PM: Total Particulate Matter (TPM), less than 10 microns (PM_{10}), and less than 2.5 microns ($PM_{2.5}$).	• Increased respiratory symptoms, stress, and illness; worsening of cardio-respiratory diseases; increased mortality rates. • Can have adverse effects on vegetation and structures, and contributes to regional haze.
Nitrogen Oxides (NO_X)	Nitrogen oxides include the gases nitrogen oxide (NO) and nitrogen dioxide (NO_2). NOx is formed primarily when nitrogen contained in fuel is used (e.g. driving a car). NO emitted during combustion quickly oxidizes to NO_2 in the atmosphere.	• NO_2 itself can cause adverse effects on respiratory systems of humans and animals, and damage to vegetation; it helps form respirable particulate matter ($PM_{2.5}$).
Volatile Organic Compounds (VOCs)	Volatile organic compounds (VOCs) are carbon-containing gases and vapours such as gasoline fumes and solvents (but excluding carbon dioxide, carbon monoxide, methane, and chlorofluorocarbons). The more reactive VOCs combine with nitrogen oxides (NO_x) in photochemical reactions in the atmosphere to form ground-level ozone.	• Many individual VOCs are known or suspected of having direct toxic effects on humans, ranging from carcinogenesis to neurotoxicity. • VOCs are also precursor pollutants to the secondary formation of fine particulate matter ($PM_{2.5}$).
Sulphur Dioxide (SO_2)	Sulphur dioxide, or SO_2, belongs to a family of sulphur oxide gases (SO_x). It is formed from the sulphur contained in raw materials such as coal, oil, and metal-containing ores during combustion and refining processes.	• Can cause adverse effects on respiratory systems of humans and animals, and damage to vegetation. • When transformed into sulphate particles that are subsequently deposited on aquatic and terrestrial ecosystems, acidification can result.
Carbon Monoxide (CO)	Carbon monoxide (CO) is a colourless, odourless, tasteless, and poisonous gas.	• Helps create a compound that inhibits the blood's capacity to carry oxygen to organs and tissues. • CO can impair exercise capacity, visual perception, manual dexterity, learning functions, and ability to perform complex tasks.

Sources: Environment Canada, Clean-Air Online (www.ec.gc.ca/cleanair-airpur/) and Exhibit 4.2, Chapter 4, May 2000 Report of the Commissioner of the Environment and Sustainable Development.

2.4 At the federal level, Environment Canada and Health Canada are responsible for regulating and assessing air pollution, through the *Canadian Environmental Protection Act, 1999*. In general, Environment Canada is responsible for measuring air pollutants, carrying out research, and regulating interprovincial and international air pollution. Health Canada is responsible for conducting research and studies relating to the health impacts of pollutants.

Measuring and reporting air quality

2.5 Two nationwide air monitoring networks collect air pollutant data in Canada. The first is the National Air Pollution Surveillance Network (NAPS) and the second is the Canadian Air and Precipitation Monitoring Network (CAPMoN). NAPS, the larger of these two networks, is operated as a partnership between Environment Canada, the provinces and territories, and municipal monitoring agencies. NAPS receives data from a total of 289 stations in 216 communities, most of them in large urban centres. Environment Canada manages CAPMoN, which receives data from 30 air quality monitoring stations located in rural settings.

2.6 To date, under the existing systems, provinces and select municipalities have communicated data from these networks through their own air quality indices. Environment Canada's Meteorological Service of Canada has been using the network data to issue forecast maximums for the current and next day's air quality. In the case of Ontario, forecasting is carried out by the Ontario Ministry of the Environment in partnership with the Meteorological Service of Canada. Some provinces also issue air quality warnings or advisories (such as smog alerts) with associated health messaging to their population. Some also have air management programs that may trigger regulatory action if levels of pollutants exceed established thresholds.

2.7 The basis for these air quality indices has been the **Index of the Quality of the Air (IQUA)**, a measurement methodology introduced in 1979. In early 2001, Environment Canada began to investigate concerns from various stakeholders about identified shortcomings in the methodology used to calculate the IQUA and the index's failure to reflect the health risks posed by the additive effect of the air pollutants. At the June 2001 Smog Summit in Toronto, the then-Minister of the Environment committed to help develop and implement a new air quality index based on health risks. In its 2004–2006 sustainable development strategy, Environment Canada also made a commitment to introduce this new health-based index. Both Environment Canada

Index of the Quality of the Air (IQUA)

Developed by an Ad Hoc Sub-Committee of the Federal-Provincial Committee on Air Pollution in 1976, the Index of the Quality of the Air was based on National Ambient Air Quality Objectives, a set of voluntary national goals for outdoor air quality. These objectives currently include sulphur dioxide, total particulate matter, carbon monoxide, nitrogen dioxide, and ground-level ozone. Provinces and territories may adopt and implement the air quality objectives according to their needs, such as incorporating them and the IQUA methodology in their air quality indices. The indices generally report on the pollutant with the highest monitored reading at the time of measurement, converted to a 0–100 scale, and this is used to represent the overall air quality relative to health impacts and/or environmental targets.

and Health Canada reiterated the commitment in their respective 2007–2010 strategies.

2.8 This commitment to introduce an air quality index based on health risks was also highlighted in the departments' responses to two **environmental petitions** that the Office of the Auditor General received relating to air quality. In 2002, the Office received petition number 55, which raised concerns about the federal government's alleged failure to create adequate regulations to control air pollution. In his response, the then-Minister of the Environment noted his previous commitment to introduce a revised IQUA. In 2003, a petitioner submitted petition number 83, relating to the issue of transboundary air pollution at the Canada–US border. The Minister of Health's response referred to the Department's commitment to play a major role in revising the IQUA, to better protect public health.

Environmental petitions

Under the *Auditor General Act*, the environmental petitions process provides Canadians with a formal means to bring their concerns about environmental issues to the attention of federal ministers and departments and to obtain a response to those concerns. With the consent of petitioners, petitions and responses are posted in our petitions catalogue on the Office of the Auditor General website (www.oag-bvg.gc.ca).

Focus of the audit

2.9 To determine the progress Environment Canada and Health Canada have made on their commitment to develop a Canada-wide air quality index based on health risks, we examined the work the departments have undertaken on the index.

2.10 More details about the objective, scope, approach, and criteria are in **About the Audit** at the end of this chapter.

Observations

The existing air quality index

2.11 As a first step in developing an air quality index based on health risks, we expected Environment Canada and Health Canada to have identified areas of weakness with the existing Index of the Quality of the Air (IQUA).

Environment Canada identified key issues with the existing air quality index

2.12 We found that in 2001, Environment Canada commissioned a report on the concerns various air quality stakeholders had expressed about the IQUA. This report reviewed the underlying criteria for the index, summarized how it had been used across the country since its introduction, and provided a comparison to the United States' air quality index. The reviewers identified three major issues with the existing index:

- **Validity of the science.** The report stated that there was substantial scientific evidence that the threshold levels the existing air quality index used to determine air quality levels and categories were outdated, and that there are no safe thresholds for these pollutants. The thresholds the existing air quality index used to determine air quality levels and categories emphasized environmental regulatory requirements, such as the levels that triggered regulatory action to get industry to reduce pollution, rather than public health concerns.

- **Inconsistency of the calculations.** The report found that the monitoring of air pollutants, including their safe level thresholds and corresponding health messages, varied by jurisdiction. The air quality index readings were based on whichever monitored pollutant was the highest at the time of measurement. In addition, different provinces used different methodologies to calculate the same air quality index value.

- **Lack of clear health messages.** The air quality index numbers the provinces generated were, in almost all cases, not accompanied by clear text explaining either the health risk or the behavioural changes individuals should undertake on days with poor air quality.

2.13 By carrying out an analysis of air quality indices in Canada, we found that the federal government identified areas of weakness in the existing index and the key issues to be addressed as it developed a new air quality index based on health risks.

Developing a new air quality health index

2.14 The development of the new air quality index based on health risks consisted of three phases. In the first phase (June 2001 to July 2002), the objective was to develop a vision for improving the air quality indices and to present recommendations for moving forward. The second phase (October 2002 to June 2003) focused on the underlying statistical and scientific basis for a new index. The third phase (July 2003 to March 2007) focused on pilot tests.

The federal government created a broad-based consultation process

2.15 We found that Environment Canada and Health Canada carried out an analysis and consulted with stakeholders as part of developing the Air Quality Health Index, which was particularly important given the shared jurisdiction over air quality, the national nature of air quality indices, and the impact of air quality on Canadians in general.

2.16 We found that in June 2001, shortly after the Toronto Smog Summit, the federal government convened a group of stakeholders from across Canada at the "Towards a Canadian Air Quality Index" workshop to develop a consensus on how to proceed to improve the state of Canadian air quality indices. This workshop identified important characteristics for an air quality index based on health risks derived directly from the observed linkage between individual health and air pollutants. In addition to the representatives from the federal government, participants included representatives from provincial governments, and stakeholders from industry, non-governmental organizations, and health authorities.

2.17 While other governance processes such as the Canadian Council of Ministers of the Environment (CCME) were available, the federal government's decision to use a broad-based process to develop the new index allowed a wider variety of stakeholders to participate in the process, rather than relying on the federal government's traditional provincial and territorial partners alone.

2.18 In the fall of 2001, the federal government created a management committee and three working groups (Health Aspects, Monitoring and Data Analysis, and Market Research and Marketing). A secretariat, jointly administered by Health Canada and Environment Canada, supported their activities. The management committee, co-chaired on a rotating basis by one federal department and one non-governmental organization, included representatives from nine provinces. It reported ad hoc to the Deputy Minister Committee of the CCME through the Deputy Minister of Environment Canada. Alberta withdrew from the entire process after April 2002, expressing concerns that the process was not following established federal-provincial consensus procedures such as those the CCME follows. Alberta had also questioned the need to develop a new, national index instead of modifying the existing air quality index.

2.19 The consultations engaged approximately 30 stakeholders in addition to the federal government and its provincial partners. The Canadian Council of Ministers of the Environment was also briefed on progress in developing the Air Quality Health Index.

2.20 We found that Environment Canada and Health Canada conducted a consultation process for developing the Air Quality Health Index that followed the principles the Treasury Board of Canada Secretariat laid out in its Guidelines for Effective Regulatory Consultations. These principles emphasize the importance of ongoing, constructive, professional relationships with stakeholders, along with

meaningfulness, openness and balance, transparency, and accountability. During the development of the Air Quality Health Index, stakeholder participation was obtained at the outset of the project. All stakeholders were considered full participants in the process, and the federal departments have maintained a continuous dialogue with the participants. Most stakeholders involved in these consultations told us that they were satisfied with the process.

The working group considered various health index options

2.21 We found that, in accordance with generally accepted scientific method, Environment Canada and Health Canada evaluated and validated the underlying science and data needed to support the development of an air quality index based on health risks.

2.22 In Phase 1 of the project, the Health Aspects working group studied two options to improve the IQUA. The first option consisted of adding fine particulate matter as one of the pollutants the existing index measured. The second option was to create a new index that would correlate the health risks of air quality, including ozone, nitrogen dioxide, carbon monoxide, sulphur dioxide, and fine particulate matter to mortality statistics. The management committee ultimately decided to proceed with the second option, which was to create a new index correlating the health risks of air quality to mortality statistics. The Monitoring and Data Analysis working group carried out a technical analysis of this recommended option.

2.23 The working group's technical analysis focused on the following:

- **The correlation of pollutants to health risks.** An analysis published by Health Canada scientists in a peer-reviewed article showed that ozone and fine particulate matter had a higher correlation to health risks than the other three pollutants. However, the analysis also found that these two pollutants alone were not sufficient to characterize the health risk in an air quality index.
- **The monitoring of pollutants.** Analyses of ozone, nitrogen dioxide, and fine particulate matter levels using the three most recent years' (1998–2000) data from the NAPS database at that time showed that readings for ozone and nitrogen dioxide at one monitoring site in a region could be considered representative of the entire region. Though the data were limited, this regional correlation was also noted for fine particulate matter. Sulphur dioxide and carbon monoxide values, on the other hand, were shown to be highly influenced by local conditions and,

consequently, measuring these pollutants at one site could not be considered regionally representative.

- **Averaging times used to assess pollutants.** Under the existing system, the choice of averaging times was generally based on air quality objectives. As a result, different averaging periods were used to monitor the various pollutants (for example, one hour for carbon monoxide or 24 hours for fine particulate matter). Since the new air quality health index was expected to reflect prevailing air quality at the time it was issued, the working group's analysis concluded that a moving, three-hour averaging period provided a stable alternative that would better relate to expected population exposure over the shorter term.
- **The monitoring network.** The analysis concluded that the existing National Air Pollution Surveillance network, if its scheduled upgrades were completed as planned by 2005, would be able to supply the data for a health-based model utilizing the three major pollutants with strong regional homogeneity (ozone, fine particulate matter, and nitrogen dioxide).

2.24 Phase 1 led the working groups and the management committee to put forward 14 recommendations that participants at the May 2002 "Steps Toward Improving Canadian Air Quality Indices" workshop endorsed prior to their presentation at the June 2002 Toronto Smog Summit. These recommendations have directed the further development of the index.

The federal government led scientific analysis to support the Air Quality Health Index

2.25 In Phase 2 of the project, Health Canada scientists carried out epidemiological studies to correlate the impact of individual and multiple pollutants on mortality rates associated with specific geographic and census boundaries. Mortality statistics were used because they are the most readily available and most extensively analyzed source of long-term health data. In a peer-reviewed article published in March 2008, Health Canada scientists noted that although there is no worldwide consensus on how to construct and interpret multi-pollutant models, they reported that the Canadian approach of a linear, no-threshold model was consistent with the position of the World Health Organization in its Guidelines for Air Quality Global Update (2005).

Epidemiology—A branch of medicine dealing with the incidence, distribution, and possible control of diseases and other factors relating to health.

2.26 Since 2001, the federal government has undertaken several initiatives to validate the underlying science behind the Air Quality Health Index:

- In 2002, the Monitoring and Data Analysis working group and the Health Aspects working group produced reports summarizing the technical analysis carried out.
- In June 2003, the "Science in Support of a Health Risk Based Air Quality Index" workshop was held where the scientific analyses in support of the air quality index based on health risks were presented.
- In Phases 1 and 2, Health Canada scientists had several peer-reviewed articles published in scientific journals that described the connection between air quality and health effects. The working groups also reviewed additional related research published earlier by the Health Canada scientists that confirmed the correlation between air pollutants and health impacts.
- In 2005, Health Canada commissioned a peer review of the health science issues underlying the index. While the reviewers provided general support for a health-based index, they noted that because there is no scientific consensus on nitrogen dioxide's relationship to health, the proportional weight given to nitrogen dioxide in the index could become a debatable issue and advised that Health Canada be prepared to defend the weighting it uses. The Department responded to the comments raised in the peer reviews and the revised document was reviewed again in 2006.
- The federal government initiated three pilot projects to test the Air Quality Health Index, beginning with British Columbia in 2005, followed by Nova Scotia in 2006 and Toronto in 2007.

2.27 We found that this scientific process resulted in a new health-based index (Air Quality Health Index) formulated to ensure that the provinces, territories, and municipalities that generate and report air quality values will apply the same methodology consistently. Doing so will allow Canadians to compare the health impacts of varying air quality between geographic areas.

The format for reporting the Air Quality Health Index emphasizes health messages

2.28 Current air quality indices measure and report air quality based on the highest single reading of five major pollutants monitored at a specific site. The reported air quality reading does not calculate the combined effect of the five pollutants on human health, nor is it

accompanied by specific wording or information needed by public health organizations to advise people what actions to take to reduce their exposure, such as rescheduling or reducing the intensity or duration of strenuous outdoor activity.

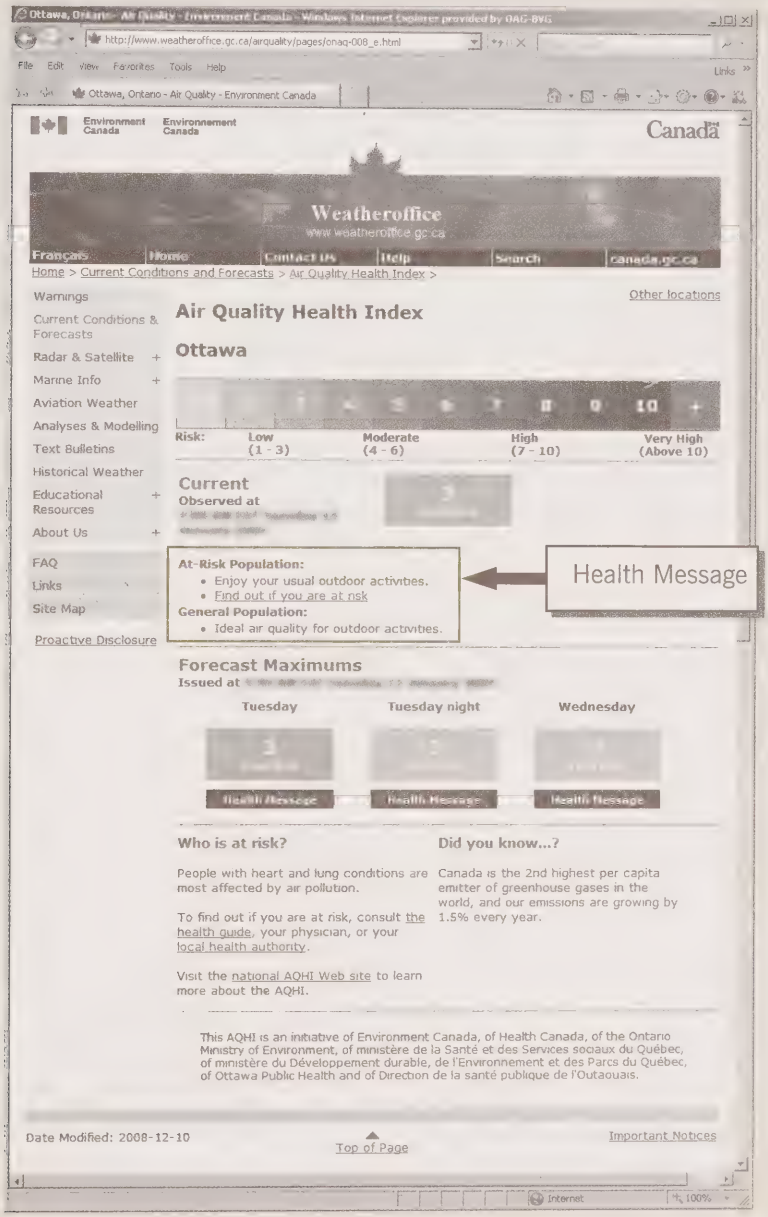
2.29 Health Canada sponsored public opinion research throughout 2004 and 2005 to measure public awareness, perceptions, and behavioural reactions to air quality, air pollution, and the air quality index. Those participating in the research reviewed the proposed Air Quality Health Index positively, including the new index's design elements and the health messaging attached to it. Subsequent reviews of the pilot projects had similar findings. This messaging, as shown in Exhibit 2.2, is expected to help Canadians reduce their exposure to air pollution by providing information to help them modify their outdoor activities on days with poor air quality.

The monitoring network covers major urban population centres

2.30 An important consideration for implementing the Air Quality Health Index was its ability to report on the same pollutants across Canada. The Monitoring and Data Analysis working group determined that if the index monitored only the three pollutants with the highest health-risk correlations (ozone, fine particulate matter, and nitrogen dioxide), the increased number of monitoring stations scheduled to be added to the NAPS network by 2005 would cover all major urban population centres with populations of more than 100,000.

2.31 In addition to data coverage, the quality of the data underlying the Air Quality Health Index is also important in correlating health risk. The participating NAPS network agencies–for example, provincial environment departments–provide quality assurance and quality control. That quality control seeks to ensure that the data the NAPS network collects are of acceptable precision, accuracy, completeness, comparability, and representativeness. The federal quality assurance and control program also includes audits and site visits. Environment Canada audits network agencies in five provinces each year, a process that includes site visits to three monitoring stations in each province. The Department carries out follow-ups to ensure that network agencies take any corrective action required. We found that the Analysis and Air Quality Division of Environment Canada manages the national NAPS data quality assurance program in accordance with generally accepted scientific methods and the government's information management guidelines.

Exhibit 2.2 Format of Air Quality Health Index puts health messaging in the foreground



Source: Adapted from Environment Canada, Weatheroffice online, 2008 (www.weatheroffice.gc.ca)

Air Quality Health Index pilot projects led to recommendations to improve health messages

2.32 We found that Health Canada and Environment Canada carried out testing of the new index through a series of pilot projects in various regions of the country. To date, three Air Quality Health Index pilot

projects have been initiated, in the provinces of British Columbia and Nova Scotia, as well as in the Greater Toronto Area. The British Columbia pilot project began in 2005. Based on its initial success in four communities, in 2006 it expanded to 14 communities. A 2007 review of the initial and expanded pilot projects led to a number of recommendations about how best to present and promote the index and its health information, including how to display the results of the index on websites, and ensuring the availability of information about the index in multiple media formats, for print, radio, and television.

2.33 The Nova Scotia pilot project began in 2006. In a qualitative research report that same year, most participants, including representatives from the general public and non-governmental organizations, expressed the belief that the Air Quality Health Index is valuable and should be implemented across Nova Scotia. The third pilot project began in Toronto in July 2007 and expanded to the Greater Toronto Area in 2008. Activities included development of education and outreach resources, including print and web information as well as an advertising campaign to generate awareness and interest in the Air Quality Health Index. A review of the results of these activities is underway and was to be completed in December 2008.

Air Quality Health Index has implementation funding until 2011

2.34 We found that in July 2007, the federal ministers of Environment and Health committed to spending $30 million over four years to support the further implementation and expansion of the Air Quality Health Index. This money will fund additional science to support the Air Quality Health Index, and assist in implementing the Air Quality Health Index in the remaining provinces and territories. It will also finance media campaigns informing Canadians about the new Air Quality Health Index and its benefits.

2.35 Implementing the Air Quality Health Index nationally is based on the federal government's partnerships with provinces, territories, and municipalities, as well as with local public health authorities, such as Toronto Public Health, and non-government organizations. We also found that the planned roll-out of the Air Quality Health Index will take place in a phased manner, beginning with the expansion of the British Columbia and the Greater Toronto Area pilot projects and the introduction of the index in Saint John, New Brunswick, in the 2008–09 fiscal year. Expansion to the remaining **census metropolitan areas** is planned to take place between 2009 and 2011.

Census metropolitan area—An area consisting of one or more adjacent municipalities centred on a major urban core. This area must have a total population of at least 100,000, of which 50,000 or more live in the urban core.

Clean Air Agenda—The Government of Canada's four-year, $1.9-billion horizontal strategy for improvements in Canada's environment, including reduced air pollution and greenhouse gas emissions. Eight federal departments and agencies are involved in designing and delivering more than 40 programs under 8 themes within the overall Agenda.

2.36 The implementation plan calls for an evaluation of the effectiveness and delivery of the Air Quality Health Index program in the 2009–10 fiscal year. In addition, since the Air Quality Health Index program is one of many programs in the federal government's Clean Air Agenda, the evaluation's results will also inform the planned 2010–11 evaluation of the Agenda.

Remaining challenges

2.37 Health Canada and Environment Canada will need to consider a number of remaining challenges as they work with their partners to implement the Air Quality Health Index across the country. These challenges, both short-term and long-term, were raised by the pilot projects, partners and stakeholders, and the two departments themselves. The following are some examples of short-term challenges:

- managing the increased implementation risk, in terms of having a common air quality index in place across the country, given that one province has not participated in the Air Quality Health Index development;
- working with the provinces on issues related to the total or partial phase-out of their existing air quality indices;
- considering whether to incorporate regionally specific pollutant issues, including smog or other advisories that may be relevant to only a few geographic areas; and
- determining, for large centres, whether to use a single averaged number derived from multiple monitors or to report these numbers separately.

2.38 In the longer term, issues that still need to be addressed include the following:

- The data collection, scientific analysis, and information developed for the Air Quality Health Index are not currently being done for smaller population centres because there are not enough monitoring sites in smaller population centres. In addition, monitoring in many of the smaller population centres does not include all the pollutants required to calculate the Air Quality Health Index, limiting its introduction in those communities. In rural areas without monitoring, it is not yet possible to estimate the health risk posed by local and transboundary pollution.
- In its progress report to the 2002 Toronto Smog Summit, the Management Committee recommended that the national air quality index based on health risks would require an ongoing development and implementation process that receives input

from environmental agencies, health agencies, outside experts, and stakeholders.

- Although the federal government allocated funding in 2007 to support the continued development and implementation of the Air Quality Health Index, it will provide this funding only until 2011. As such, there is a risk that the remaining issues, some of which are long-term, and the Index's ongoing development will not be fully addressed.

Conclusion

2.39 By developing an air quality health index, Environment Canada and Health Canada have made satisfactory progress in meeting the commitment they reiterated in responses to two environmental petitions (Exhibit 2.3). They carried out scientific research leading to the selection of three major pollutants affecting human health that need to be monitored across Canada (the combined impact of ground-level ozone, fine particulate matter, and nitrogen dioxide). They assessed whether the planned upgrades to the national monitoring network would permit it to focus on these substances and to cover major urban centres. The departments developed an underlying formula so that the air quality values used in the Air Quality Health Index would be consistent across the country. They also produced new health messaging to accompany the Index's air quality values, so individual Canadians can understand it more easily and decide what precautions they need to take when air pollution is high in their area.

Exhibit 2.3 Progress on addressing the commitment to develop a Canada-wide air quality index based on health risks

Health Canada and Environment Canada sustainable development strategies, reiterated in responses to petitions 55 and 83	
Commitment	**Progress**
Whether Environment Canada and Health Canada can demonstrate that they have made reasonable progress on their commitment to develop a Canada-wide air quality index based on health risks.	**Satisfactory**

Satisfactory—Progress is satisfactory, given the significance and complexity of the issue, and the time that has elapsed since the commitment was made.

Unsatisfactory—Progress is unsatisfactory, given the significance and complexity of the issue, and the time that has elapsed since the commitment was made.

2.40 While Environment Canada and Health Canada are working with their partners to roll out the Air Quality Health Index nationally, some long-term challenges remain. These challenges include

- dealing with an increased risk that a common index may not be put in place across the country, given that not all jurisdictions participated in the index development process;
- working with the provinces on issues related to the continued use of existing air quality indices;
- expanding monitoring to smaller, rural areas; and
- considering whether to incorporate local and regionally specific pollutant issues that could also have harmful health effects.

About the Audit

Objective

To determine whether Environment Canada and Health Canada can demonstrate that they have made reasonable progress on their commitment to develop a Canada-wide air quality index based on health risks.

Scope and approach

We examined the work carried out by Environment Canada and Health Canada in revising the Index of the Quality of the Air (IQUA) to reflect health risks. This work led to the development of the Air Quality Health Index.

Our audit approach focused on reviewing relevant documentation and interviewing with federal, provincial, and municipal officials, and representatives of non-governmental organizations.

Criteria

Listed below are the criteria that were used to conduct this audit and their sources.

Criteria	Sources
• We expected Environment Canada and Health Canada to have identified areas of weakness with the Index of the Quality of the Air (IQUA). • We expected Environment Canada and Health Canada to have evaluated and validated (through peer review and other techniques) the underlying science and data needed to support the development of a health risk-based index, including the development of the Air Quality Health Index. • We expected Environment Canada and Health Canada to have carried out analysis and consulted with stakeholders as part of the development of the Air Quality Health Index. • We expected Environment Canada and Health Canada to have identified the information required for the calculation of the Air Quality Health Index. • We expected Environment Canada and Health Canada to have assessed the adequacy of the data used for the Air Quality Health Index, including ensuring its ongoing accuracy and relevancy. • We expected Environment Canada and Health Canada to have set timelines, objectives, and resources for the national implementation of the Air Quality Health Index.	• Responses to petitions 55 and 83. • Petition 83: Fourth paragraph under Health Canada's response to question 1—see Environmental Petitions Catalogue on the OAG website at www.oag-bvg.gc.ca • Petition 55: Fourth bullet under the second paragraph of the joint response's air quality monitoring programs section. • Commitments made in Environment Canada's sustainable development strategies (2004–2006 (page 12) and 2007–2009 (page 16)) and Health Canada's sustainable development strategy (2007–2010 (page 25)).

These audit criteria represent a set of reasonable expectations and the departments' management agreed with the applicability of these criteria.

Audit work completed

Audit work for this chapter was substantially completed on 29 August 2008.

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